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APPENDIX A: SAR DISTRIBUTION COMPARISON FOR ACCURACY VERIFICATION

Revision History		
Rev. Number	Date	Changes
Initial	May 24, 2013	----- ----
Rev 2	Dec 16, 2014	Added Dipole plots used for 802.11a Hotspot mode testing 1. Page 36-37

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Date/Time: 12/9/2012 8:52:57 PM

Test Laboratory: RIM Testing Services

DipoleValidation_835MHz_12_09_12_Amb_Tem_24.5_Liq_Tem_22.5C

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:446

Communication System: CW; Frequency: 835 MHz; Communication System PAR: 0 dB;
PMF: 1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.887 \text{ mho/m}$; $\epsilon_r = 40.135$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV3 - SN3225; ConvF(6.06, 6.06, 6.06); Calibrated: 1/11/2012
- Sensor-Surface: 3mm (Mechanical Surface Detection), $z = 2.0, 32.0$
- Electronics: DAE3 Sn473; Calibrated: 1/13/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS 52.8.0(692); SEMCAD X 14.6.4(4989)

Configuration/d=15mm, Pin=1000mW/Area Scan (31x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 113.9 V/m; Power Drift = -0.04 dB

Fast SAR: SAR(1 g) = 9.44 mW/g; SAR(10 g) = 6.4 mW/g

Maximum value of SAR (interpolated) = 10.803 mW/g

Configuration/d=15mm, Pin=1000mW/Zoom Scan (5x5x7) 2 2 (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

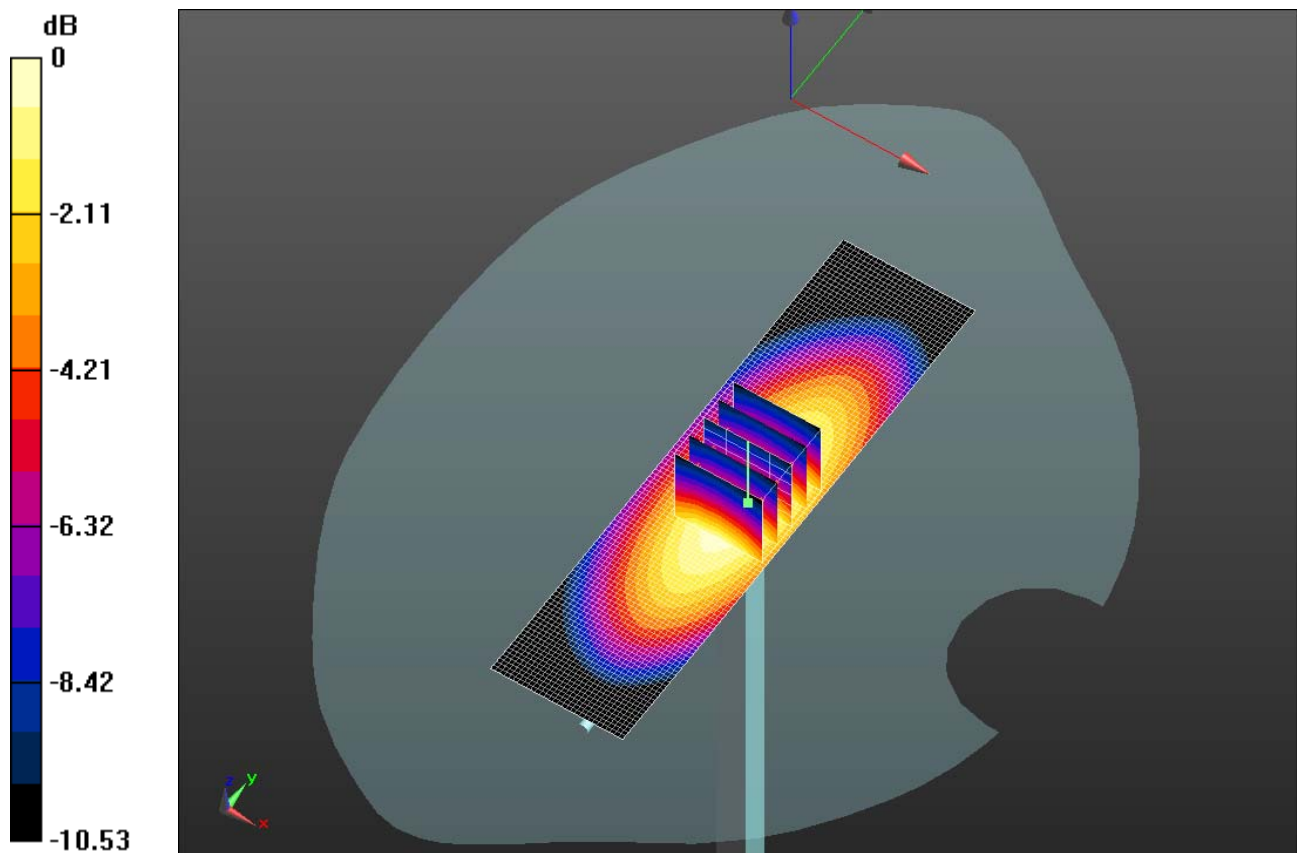
Reference Value = 113.9 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 13.7780

SAR(1 g) = 9.37 mW/g; SAR(10 g) = 6.15 mW/g

Maximum value of SAR (measured) = 10.977 mW/g

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0 dB = 10.980mW/g = 20.81 dB mW/g

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Date/Time: 2/4/2013 12:35:58 PM

Test Laboratory: RIM Testing Services

DipoleValidation_835MHz_02_04_13

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d043

Communication System: CW; Frequency: 835 MHz; Communication System PAR: 0 dB;
PMF: 1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.897 \text{ S/m}$; $\epsilon_r = 40.049$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ET3DV6 - SN1644; ConvF(6.24, 6.24, 6.24); Calibrated: 11/13/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 2.7, 32.7$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS2 52.8.4(1052); SEMCAD X 14.6.8(7028)

Configuration/d=15mm, Pin=1000mW/Area Scan (31x121x1): Interpolated
grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Reference Value = 108.5 V/m ; Power Drift = -0.04 dB

Fast SAR: SAR(1 g) = 9.15 W/kg; SAR(10 g) = 6.24 W/kg

Maximum value of SAR (interpolated) = 9.77 W/kg

Configuration/d=15mm, Pin=1000mW/Zoom Scan (5x5x7) (5x5x7)/Cube

0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

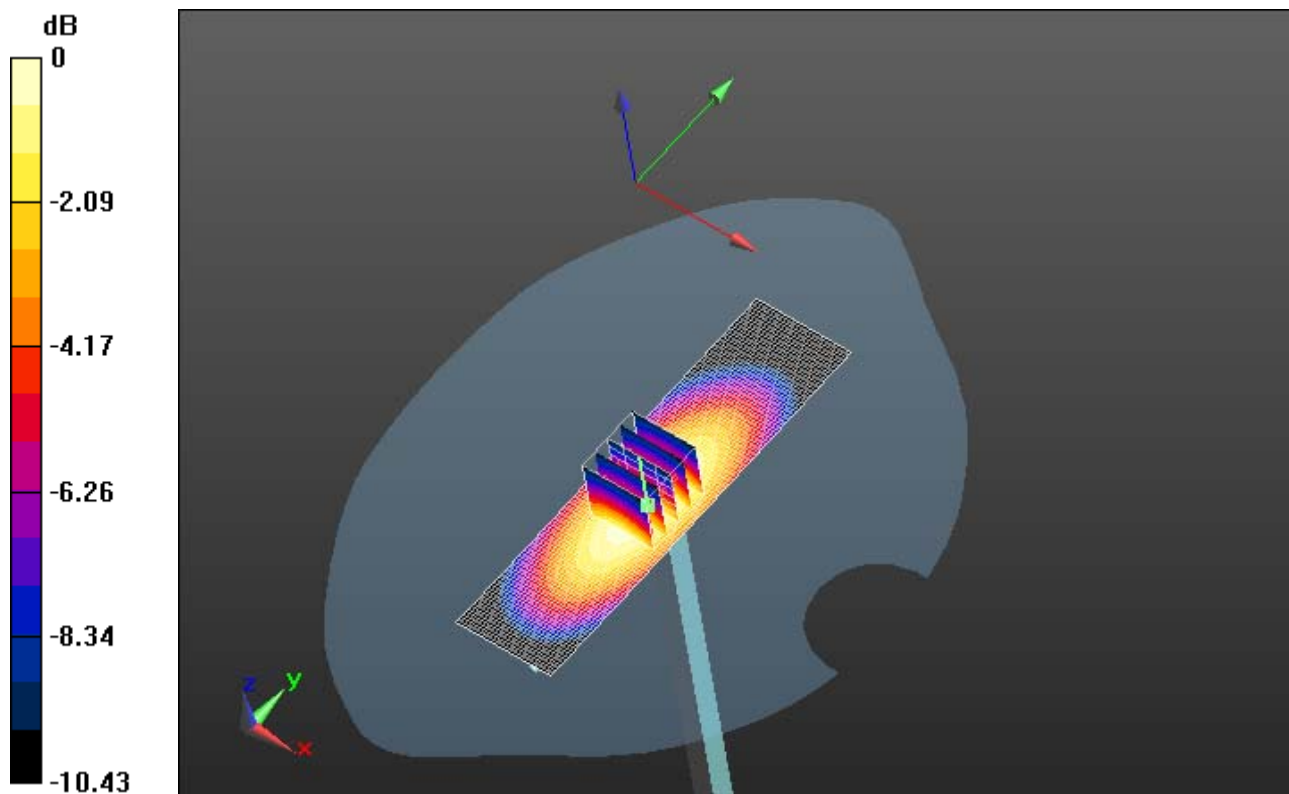
Reference Value = 108.5 V/m ; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 13.2 W/kg

SAR(1 g) = 9.2 W/kg; SAR(10 g) = 6.05 W/kg

Maximum value of SAR (measured) = 9.95 W/kg

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0 dB = 9.95 W/kg = 9.98 dBW/kg

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Date/Time: 11/26/2012 10:01:06 AM

Test Laboratory: RIM Testing Services

DipoleValidation_1900MHz_11_26_12_Amb_Tem_24.3_Liq_Tem_22.6C

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:545

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.364 \text{ S/m}$; $\epsilon_r = 38.889$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV3 - SN3225; ConvF(5.23, 5.23, 5.23); Calibrated: 1/11/2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection), $z = 2.0, 32.0$
- Electronics: DAE3 Sn473; Calibrated: 1/13/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS2 52.8.0(692); SEMCAD X 14.6.8(7028)

Configuration/d=10mm, Pin=1000mW/Area Scan (31x61x1): Interpolated

grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Reference Value = 193.8 V/m ; Power Drift = 0.04 dB

Fast SAR: SAR(1 g) = 38.8 W/kg ; SAR(10 g) = 20.5 W/kg

Maximum value of SAR (interpolated) = 48.6 W/kg

Configuration/d=10mm, Pin=1000mW/Zoom Scan (5x5x7) 2 (5x5x7)/Cube

0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

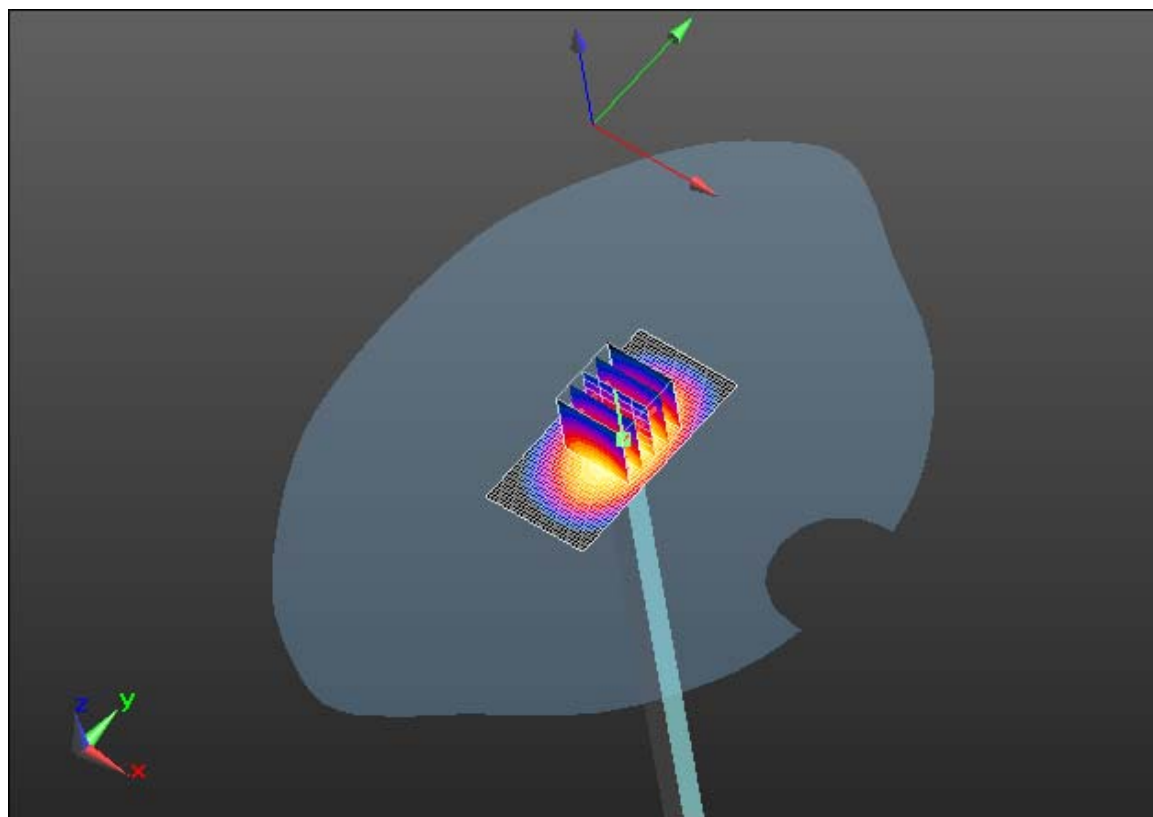
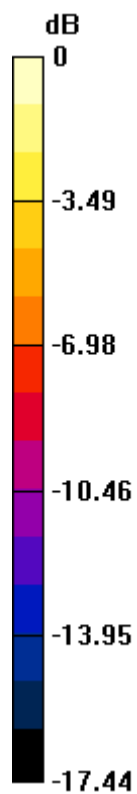
Reference Value = 193.8 V/m ; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 69.0 W/kg

SAR(1 g) = 38.3 W/kg ; SAR(10 g) = 20 W/kg

Maximum value of SAR (measured) = 48.6 W/kg

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0 dB = 48.6 W/kg = 16.87 dBW/kg

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Date/Time: 11/30/2012 12:03:43 PM

Test Laboratory: RIM Testing Services

DipoleValidation_1900MHz_11_30_12_Amb_Tem_24.7_Liq_Tem_22.6C

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:545

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.381$ S/m; $\epsilon_r = 39.434$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV3 - SN3225; ConvF(5.23, 5.23, 5.23); Calibrated: 1/11/2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection), $z = 2.0, 32.0$
- Electronics: DAE3 Sn473; Calibrated: 1/13/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS 52.8.0(692); SEMCAD X 14.6.8(7028)

Configuration/d=10mm, Pin=1000mW/Area Scan (31x61x1): Interpolated

grid: $dx=1.500$ mm, $dy=1.500$ mm

Reference Value = 196.0 V/m; Power Drift = -0.01 dB

Fast SAR: SAR(1 g) = 39.6 W/kg; SAR(10 g) = 21 W/kg

Maximum value of SAR (interpolated) = 49.4 W/kg

Configuration/d=10mm, Pin=1000mW/Zoom Scan (5x5x7) 2 (5x5x7)/Cube

0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

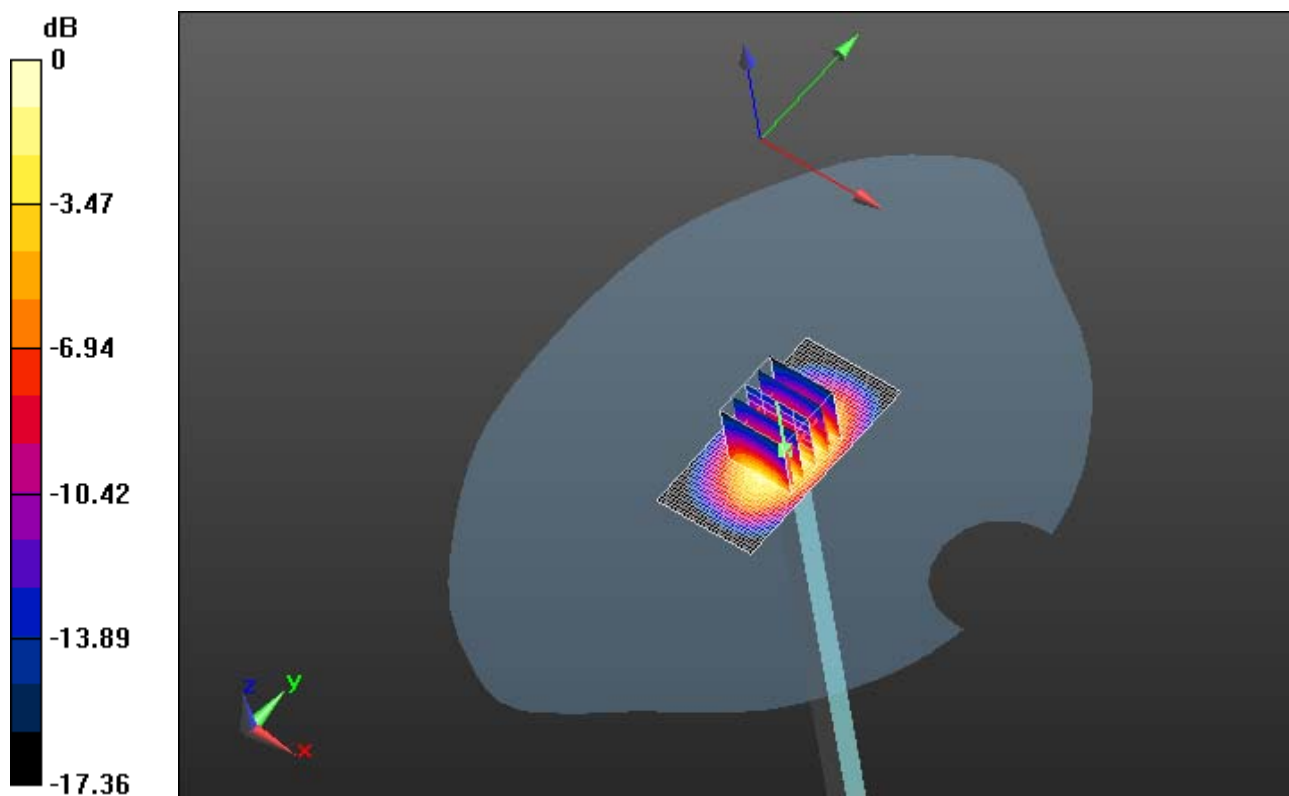
Reference Value = 196.0 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 71.1 W/kg

SAR(1 g) = 39.3 W/kg; SAR(10 g) = 20.5 W/kg

Maximum value of SAR (measured) = 50.2 W/kg

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0 dB = 50.2 W/kg = 17.01 dBW/kg

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Date/Time: 12/2/2012 3:35:39 PM

Test Laboratory: RIM Testing Services

DipoleValidation_1900MHz_12_02_12_Amb_Tem_24.1_Liq_Tem_22.7C

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:545

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.398$ S/m; $\epsilon_r = 40.853$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV3 - SN3225; ConvF(5.23, 5.23, 5.23); Calibrated: 1/11/2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection), $z = 2.0, 32.0$
- Electronics: DAE3 Sn473; Calibrated: 1/13/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS 52.8.0(692); SEMCAD X 14.6.8(7028)

Configuration/d=10mm, Pin=1000mW/Area Scan (31x61x1): Interpolated

grid: $dx=1.500$ mm, $dy=1.500$ mm

Reference Value = 197.2 V/m; Power Drift = -0.53 dB

Fast SAR: SAR(1 g) = 40.2 W/kg; SAR(10 g) = 21.3 W/kg

Maximum value of SAR (interpolated) = 50.3 W/kg

Configuration/d=10mm, Pin=1000mW/Zoom Scan (5x5x7) 2 (5x5x7)/Cube

0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

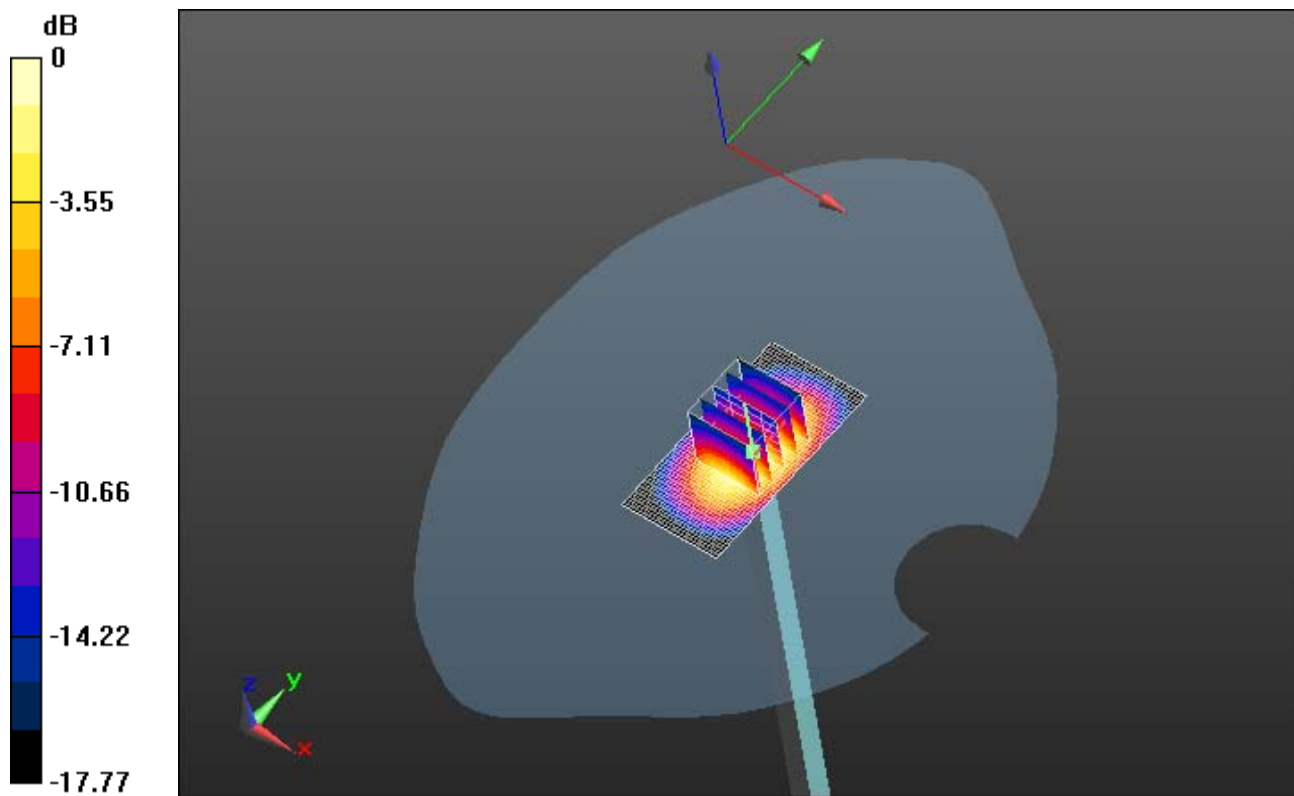
Reference Value = 197.2 V/m; Power Drift = -0.53 dB

Peak SAR (extrapolated) = 72.6 W/kg

SAR(1 g) = 40.1 W/kg; SAR(10 g) = 20.9 W/kg

Maximum value of SAR (measured) = 51.1 W/kg

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0 dB = 51.1 W/kg = 17.08 dBW/kg

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Date/Time: 1/24/2013 3:04:32 PM

Test Laboratory: RIM Testing Services

DipoleValidation_1900MHz_01_24_13

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d075

Communication System: CW; Communication System Band: CW; Frequency: 1900 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.441 \text{ S/m}$; $\epsilon_r = 38.17$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ET3DV6 - SN1644; ConvF(5.21, 5.21, 5.21); Calibrated: 11/13/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 2.7, 32.7$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS 52.8.4(1052); SEMCAD X 14.6.8(7028)

Configuration/d=10mm, Pin=1000mW/Area Scan (31x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Reference Value = 180.2 V/m ; Power Drift = -0.05 dB

Fast SAR: SAR(1 g) = 38.5 W/kg ; SAR(10 g) = 20.4 W/kg

Maximum value of SAR (interpolated) = 43.6 W/kg

Configuration/d=10mm, Pin=1000mW/Zoom Scan (5x5x7) (5x5x7)/Cube

0: Measurement grid: $dx=7.5 \text{ mm}$, $dy=7.5 \text{ mm}$, $dz=5 \text{ mm}$

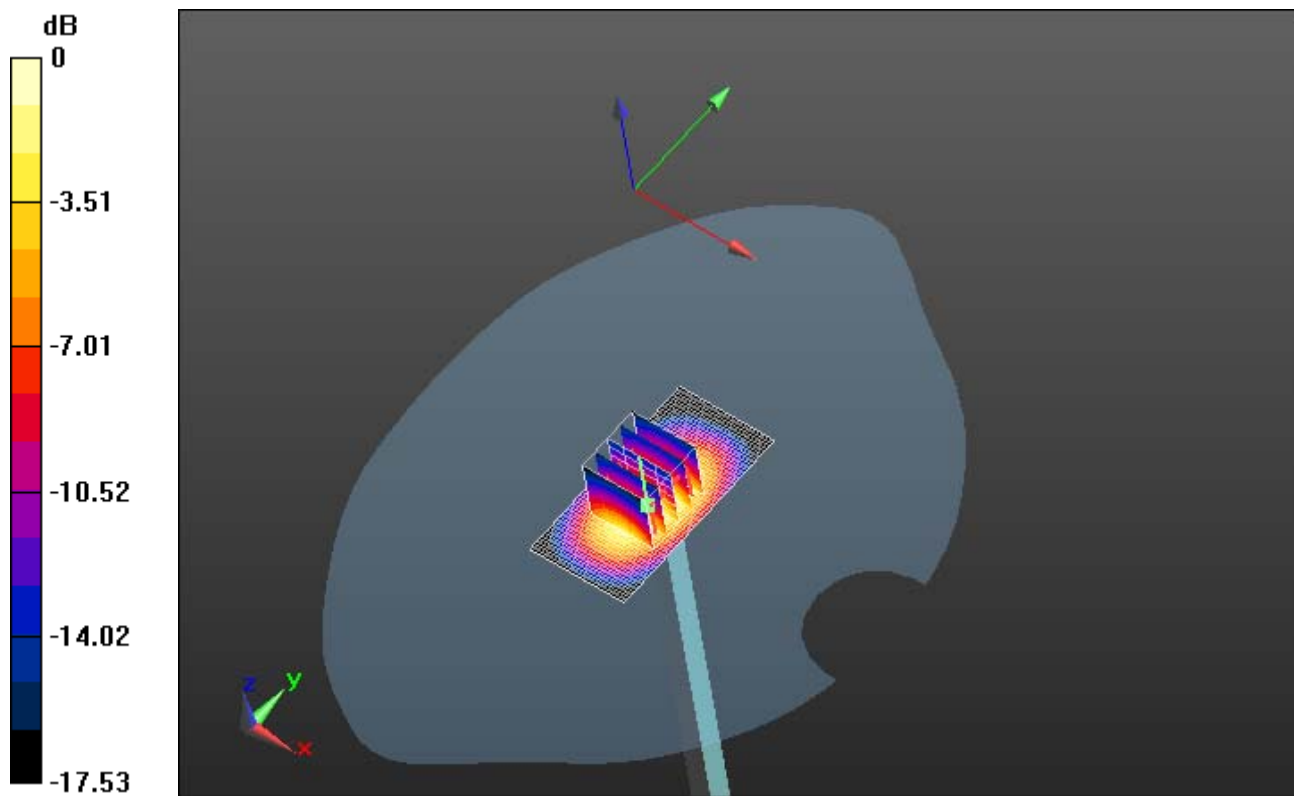
Reference Value = 180.2 V/m ; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 61.6 W/kg

SAR(1 g) = 36.8 W/kg ; SAR(10 g) = 19.6 W/kg

Maximum value of SAR (measured) = 41.6 W/kg

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0 dB = 41.6 W/kg = 16.19 dBW/kg

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Date/Time: 1/24/2013 9:17:21 PM

Test Laboratory: RIM Testing Services

DipoleValidation_1900MHz_01_24_13_R2

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d075

Communication System: CW; Communication System Band: CW; Frequency: 1900 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.389 \text{ S/m}$; $\epsilon_r = 38.653$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

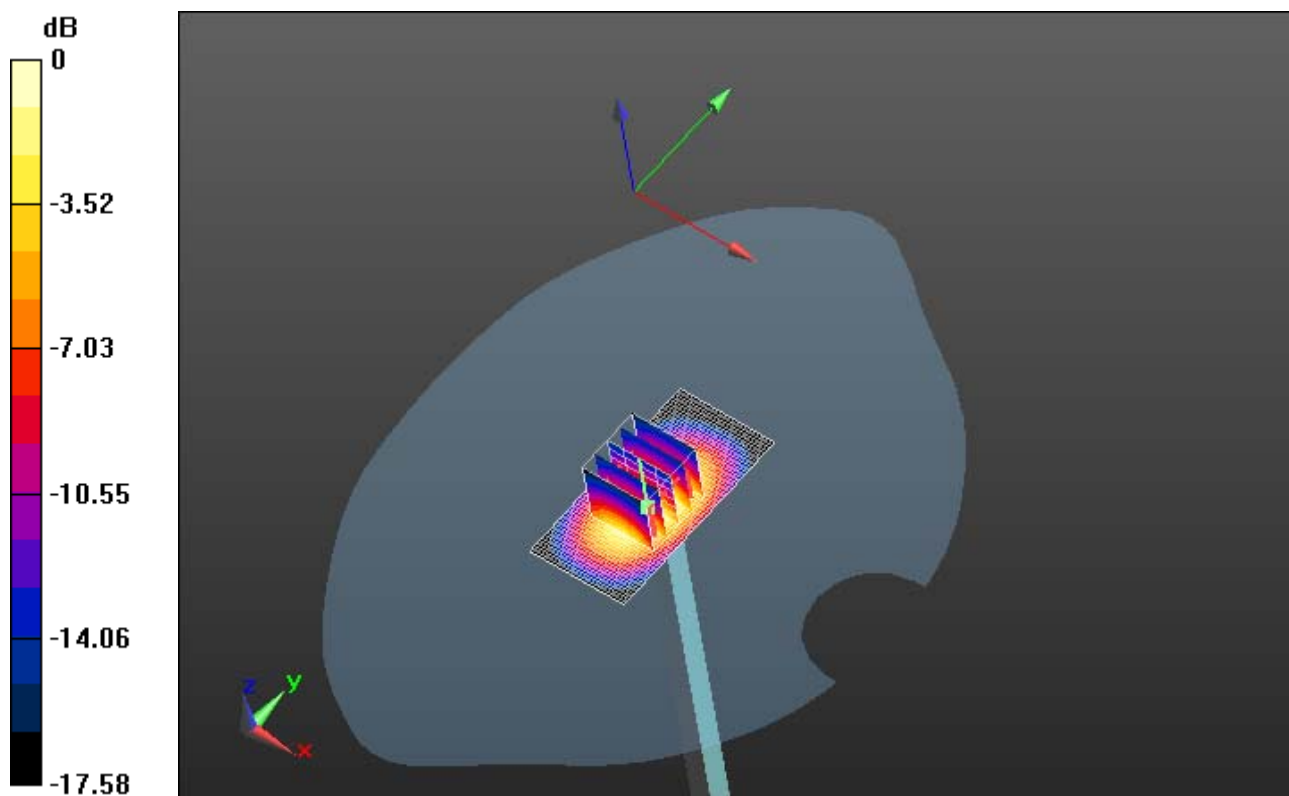
DASY Configuration:

- Probe: ET3DV6 - SN1644; ConvF(5.21, 5.21, 5.21); Calibrated: 11/13/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 2.7, 32.7$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS2 52.8.4(1052); SEMCAD X 14.6.8(7028)

Configuration/d=10mm, Pin=1000mW/Area Scan (31x61x1): Interpolated
grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Reference Value = 184.4 V/m ; Power Drift = -0.11 dB
Fast SAR: SAR(1 g) = 38.3 W/kg; SAR(10 g) = 20.3 W/kg
Maximum value of SAR (interpolated) = 43.3 W/kg

Configuration/d=10mm, Pin=1000mW/Zoom Scan (5x5x7) (5x5x7)/Cube
0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$
Reference Value = 184.4 V/m ; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 62.1 W/kg
SAR(1 g) = 36.9 W/kg; SAR(10 g) = 19.6 W/kg
Maximum value of SAR (measured) = 42.0 W/kg

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0 dB = 42.0 W/kg = 16.23 dBW/kg

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Date/Time: 1/28/2013 9:36:48 AM

Test Laboratory: RIM Testing Services

DipoleValidation_1900MHz_01_28_13

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d075

Communication System: CW; Communication System Band: CW; Frequency: 1900 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.38 \text{ S/m}$; $\epsilon_r = 38.322$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ET3DV6 - SN1644; ConvF(5.21, 5.21, 5.21); Calibrated: 11/13/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 2.7, 32.7$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS2 52.8.4(1052); SEMCAD X 14.6.8(7028)

Configuration/d=10mm, Pin=1000mW/Area Scan (31x61x1): Interpolated

grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Reference Value = 185.6 V/m ; Power Drift = -0.04 dB

Fast SAR: SAR(1 g) = 38.2 W/kg ; SAR(10 g) = 20.4 W/kg

Maximum value of SAR (interpolated) = 43.0 W/kg

Configuration/d=10mm, Pin=1000mW/Zoom Scan (5x5x7) (5x5x7)/Cube

0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

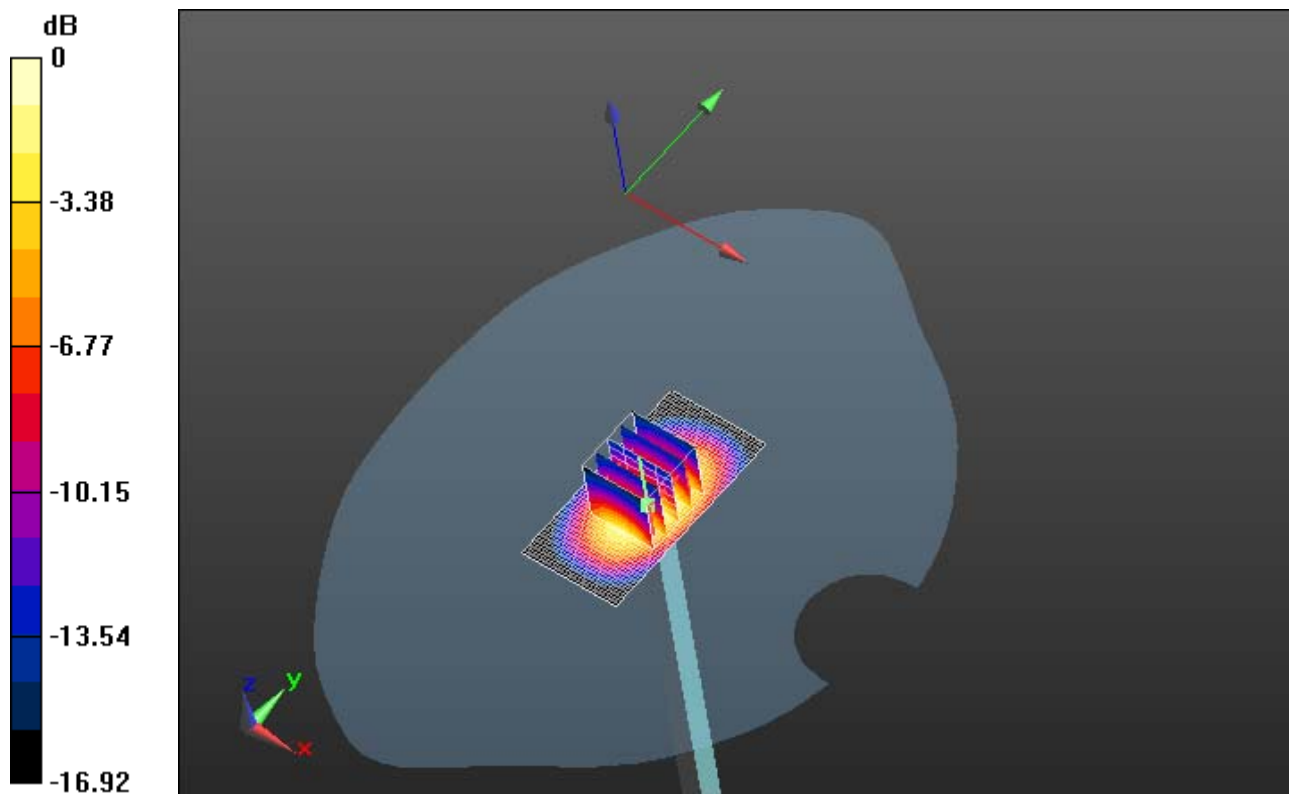
Reference Value = 185.6 V/m ; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 60.5 W/kg

SAR(1 g) = 36.9 W/kg ; SAR(10 g) = 19.9 W/kg

Maximum value of SAR (measured) = 41.7 W/kg

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0 dB = 41.7 W/kg = 16.20 dBW/kg

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Date/Time: 1/18/2013 10:06:57 AM

Test Laboratory: RIM Testing Services

DipoleValidation_2450MHz_01_18_13

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:747

Communication System: CW; Communication System Band: D2450 (2450.0 MHz);
Frequency: 2450 MHz; Communication System PAR: 0 dB; PMF: 1
Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.79 \text{ S/m}$; $\epsilon_r = 37.649$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

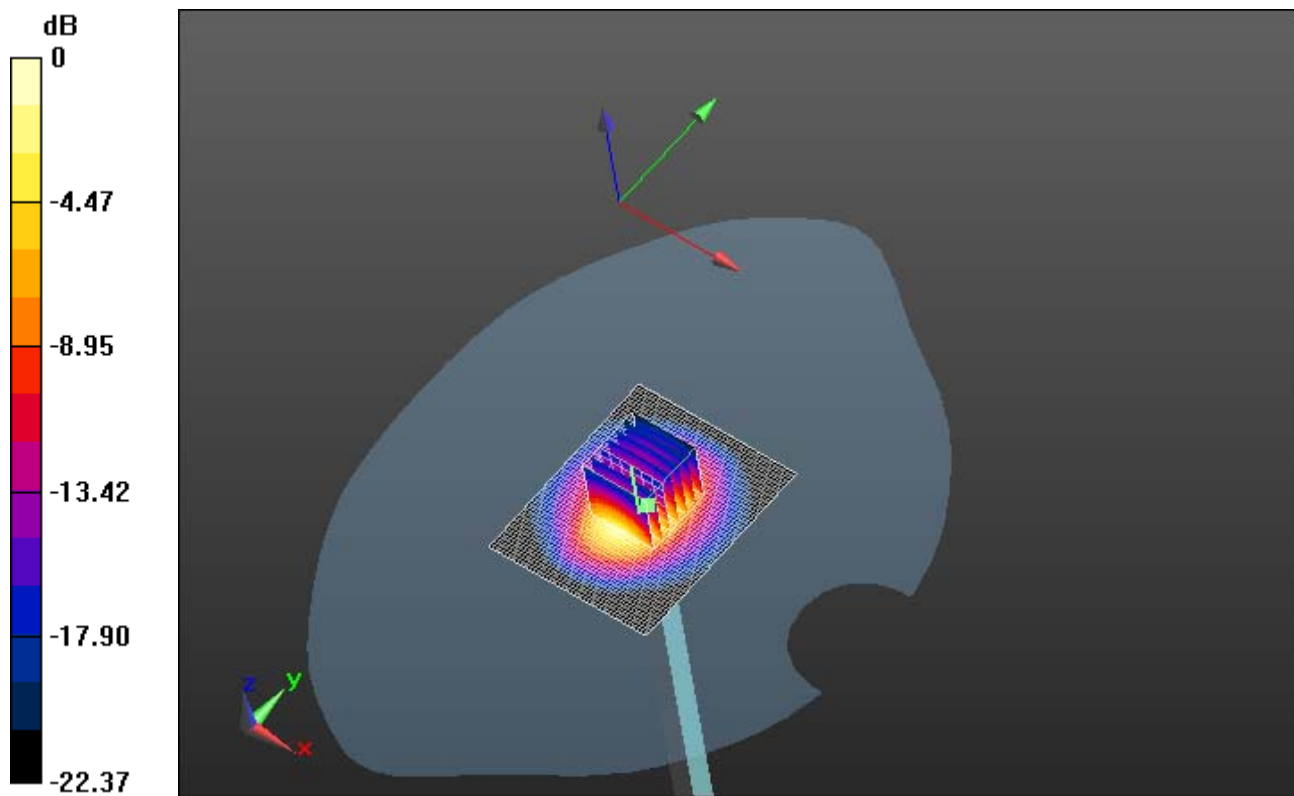
DASY Configuration:

- Probe: ET3DV6 - SN1644; ConvF(4.6, 4.6, 4.6); Calibrated: 11/13/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 2.7, 32.7$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

**System Performance Check at Frequencies above 1 GHz/d=10mm,
Pin=1000 mW, dist=4.0mm (ET-Probe)/Area Scan (51x61x1):** Interpolated
grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Reference Value = 188.1 V/m; Power Drift = -0.02 dB
Fast SAR: SAR(1 g) = 53.5 W/kg; SAR(10 g) = 25.4 W/kg
Maximum value of SAR (interpolated) = 69.4 W/kg

**System Performance Check at Frequencies above 1 GHz/d=10mm,
Pin=1000 mW, dist=4.0mm (ET-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube
0:** Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
Reference Value = 188.1 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 113 W/kg
SAR(1 g) = 52.6 W/kg; SAR(10 g) = 24.6 W/kg
Maximum value of SAR (measured) = 58.1 W/kg

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0 dB = 58.1 W/kg = 17.64 dBW/kg

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Date/Time: 1/21/2013 9:29:55 AM

Test Laboratory: RIM Testing Services

DipoleValidation_2450MHz_01_21_13

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:747

Communication System: CW; Communication System Band: D2450 (2450.0 MHz);

Frequency: 2450 MHz; Communication System PAR: 0 dB; PMF: 1

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.761 \text{ S/m}$; $\epsilon_r = 37.375$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ET3DV6 - SN1644; ConvF(4.6, 4.6, 4.6); Calibrated: 11/13/2012;
- Sensor-Surface: 4mm (Mechanical Surface Detection), $z = 2.7, 32.7$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

System Performance Check at Frequencies above 1 GHz/d=10mm,

Pin=1000 mW, dist=4.0mm (ET-Probe)/Area Scan (51x61x1): Interpolated

grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Reference Value = 188.5 V/m; Power Drift = -0.11 dB

Fast SAR: SAR(1 g) = 52.1 W/kg; SAR(10 g) = 24.7 W/kg

Maximum value of SAR (interpolated) = 67.7 W/kg

System Performance Check at Frequencies above 1 GHz/d=10mm,

Pin=1000 mW, dist=4.0mm (ET-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube

0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

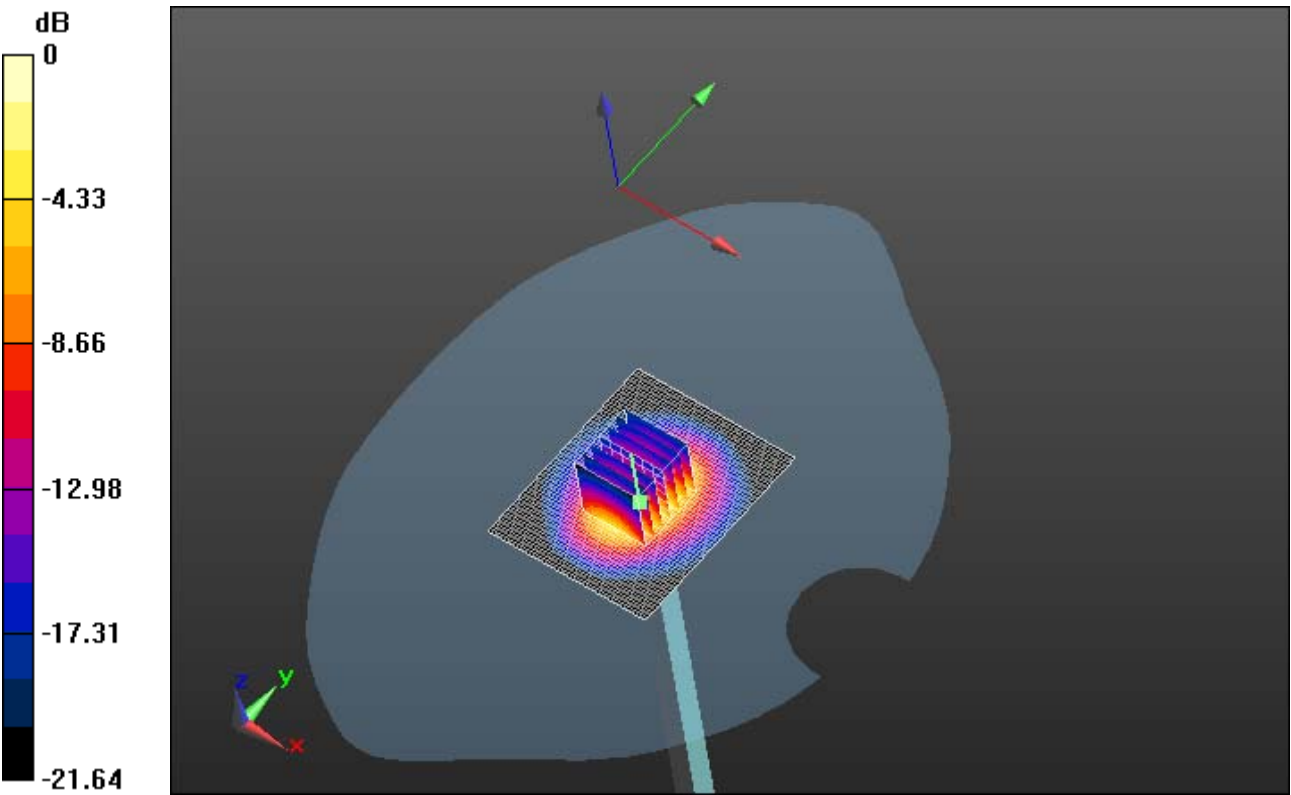
Reference Value = 188.5 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 108 W/kg

SAR(1 g) = 50.9 W/kg; SAR(10 g) = 24.1 W/kg

Maximum value of SAR (measured) = 56.7 W/kg

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0 dB = 56.7 W/kg = 17.54 dBW/kg

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Date/Time: 2/27/2013 7:27:44 PM

Test Laboratory: RIM Testing Services

DipoleValidation_2450MHz_02_27_13_Amb_Tem_24.0C_Liq_Tem_20.5 C

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:747

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.783$ S/m; $\epsilon_r = 37.687$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV3 - SN3225; ConvF(4.65, 4.65, 4.65); Calibrated: 1/10/2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection), $z = 2.0, 32.0$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

**System Performance Check at Frequencies above 1 GHz/d=10mm,
Pin=1000 mW, dist=3.0mm (ES-Probe)/Area Scan (61x71x1):** Interpolated

grid: $dx=1.200$ mm, $dy=1.200$ mm

Reference Value = 201.8 V/m; Power Drift = 0.03 dB

Fast SAR: SAR(1 g) = 50.4 W/kg; SAR(10 g) = 22.4 W/kg

Maximum value of SAR (interpolated) = 69.3 W/kg

**System Performance Check at Frequencies above 1 GHz/d=10mm,
Pin=1000 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube**

0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

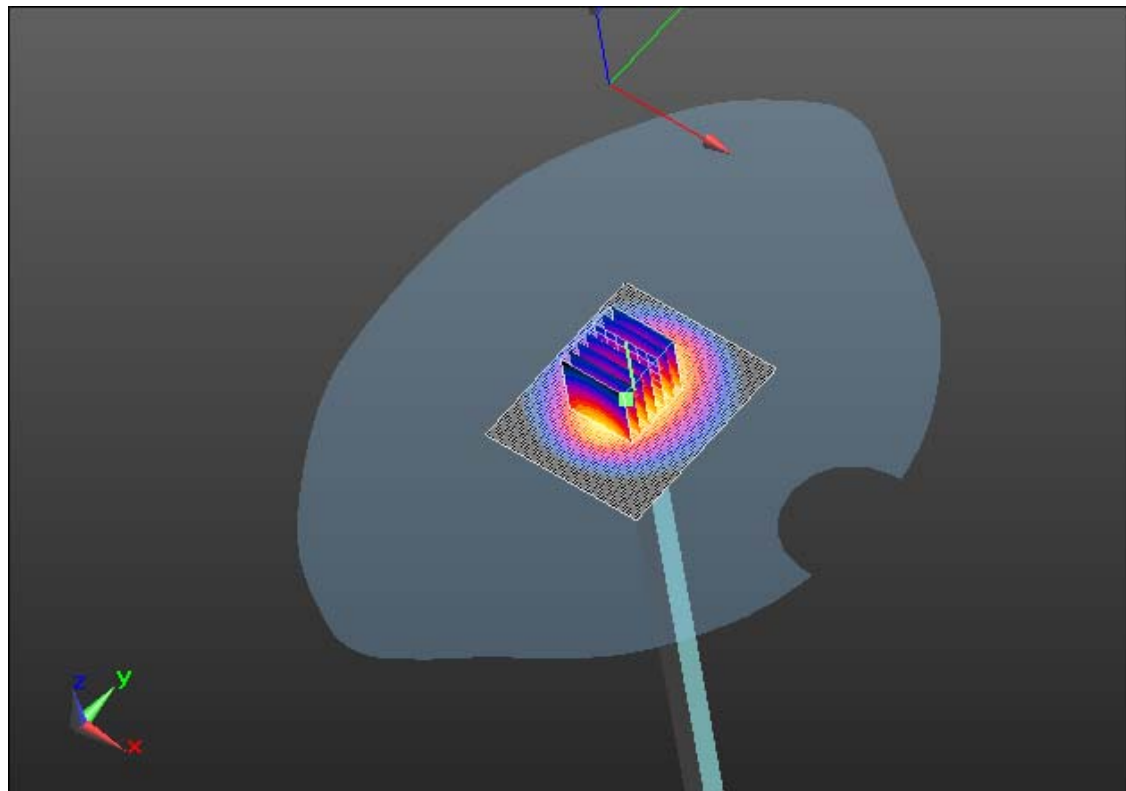
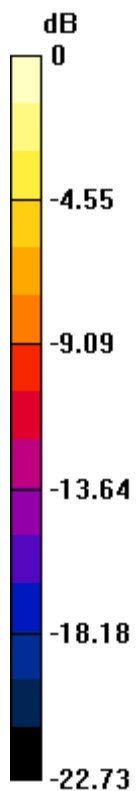
Reference Value = 201.8 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 98.9 W/kg

SAR(1 g) = 49.6 W/kg; SAR(10 g) = 23.2 W/kg

Maximum value of SAR (measured) = 64.7 W/kg

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0 dB = 64.7 W/kg = 18.11 dBW/kg

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Date/Time: 1/14/2013 3:37:52 PM

Test Laboratory: RIM Testing Services

Dipole Validation_5200 MHz_01_14_13

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1033

Communication System: CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz; Communication System PAR: 0 dB; PMF: 1.12202e-005
Medium parameters used: $f = 5200$ MHz; $\sigma = 4.66$ S/m; $\epsilon_r = 34.349$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.73, 4.73, 4.73); Calibrated: 11/14/2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS2 52.8.4(1052); SEMCAD X 14.6.8(7028)

System Performance Check with D5GHzV2 Dipole/d=10mm, Pin=1000

mW, f=5200 MHz/Area Scan (41x51x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Reference Value = 199.9 V/m; Power Drift = -0.00 dB

Fast SAR: SAR(1 g) = 80.9 W/kg; SAR(10 g) = 22.5 W/kg

Maximum value of SAR (interpolated) = 191 W/kg

System Performance Check with D5GHzV2 Dipole/d=10mm, Pin=1000

mW, f=5200 MHz/Zoom Scan -Ext(24x24x22), Step (4x4x2mm), dist=2mm (7x7x12)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

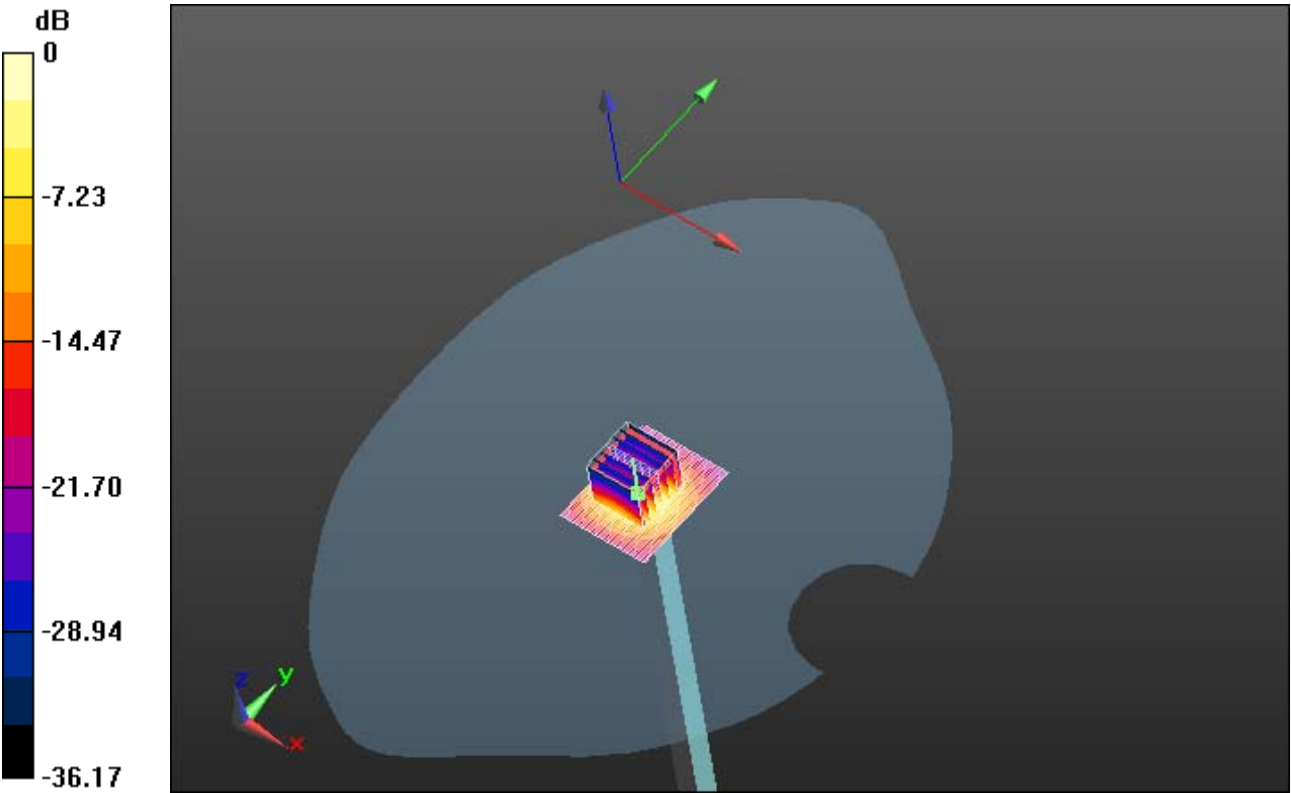
Reference Value = 199.9 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 327 W/kg

SAR(1 g) = 83.5 W/kg; SAR(10 g) = 24.2 W/kg

Maximum value of SAR (measured) = 172 W/kg

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0 dB = 172 W/kg = 22.36 dBW/kg

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Date/Time: 2/25/2013 5:10:38 PM

Test Laboratory: RIM Testing Services

Dipole

Validation_5200MHz_02_25_13_Amb_Tem_24.3_Liq_Tem_21.7C

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1033

Communication System: CW; Frequency: 5200 MHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.746$ S/m; $\epsilon_r = 34.675$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.73, 4.73, 4.73); Calibrated: 11/14/2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASYS 52.8.4(1052); SEMCAD X 14.6.8(7028)

System Performance Check with D5GHzV2 Dipole/d=10mm, Pin=1000 mW, f=5200 MHz/Area Scan (41x51x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Reference Value = 197.8 V/m; Power Drift = -0.05 dB

Fast SAR: SAR(1 g) = 75.2 W/kg; SAR(10 g) = 20.6 W/kg

Maximum value of SAR (interpolated) = 179 W/kg

System Performance Check with D5GHzV2 Dipole/d=10mm, Pin=1000 mW, f=5200 MHz/Zoom Scan -Ext(24x24x22), Step (4x4x2mm), dist=2mm (9x9x12)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

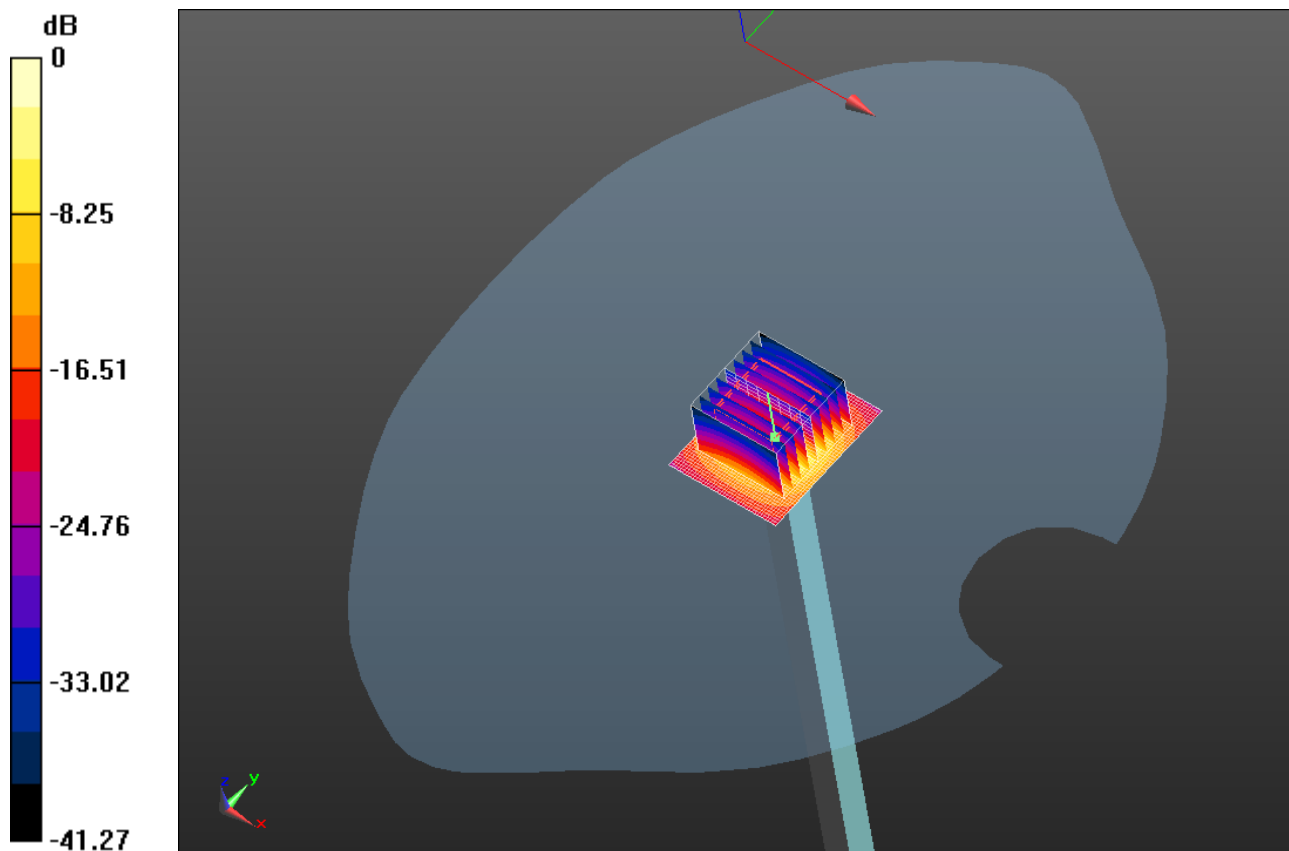
Reference Value = 197.8 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 301 W/kg

SAR(1 g) = 77.5 W/kg; SAR(10 g) = 22.4 W/kg

Maximum value of SAR (measured) = 160 W/kg

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0 dB = 160 W/kg = 22.04 dBW/kg

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Date/Time: 1/14/2013 3:13:34 PM

Test Laboratory: RIM Testing Services

Dipole Validation_5500 MHz_01_14_13

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1033

Communication System: CW-5GHz; Frequency: 5500 MHz; Communication System
PAR: 0 dB; PMF: 1

Medium parameters used: $f = 5500 \text{ MHz}$; $\sigma = 5.102 \text{ S/m}$; $\epsilon_r = 34.159$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.28, 4.28, 4.28); Calibrated: 11/14/2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

System Performance Check with D5GHzV2 Dipole 2/d=10mm,

Pin=1000mW, f=5500 MHz/Area Scan (41x51x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 208.5 V/m; Power Drift = -0.05 dB

Fast SAR: SAR(1 g) = 89.9 W/kg; SAR(10 g) = 24.5 W/kg

Maximum value of SAR (interpolated) = 217 W/kg

System Performance Check with D5GHzV2 Dipole 2/d=10mm,

Pin=1000mW, f=5500 MHz/Zoom Scan -Ext(24x24x22), Step (4x4x2mm), dist=2mm (7x7x12)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

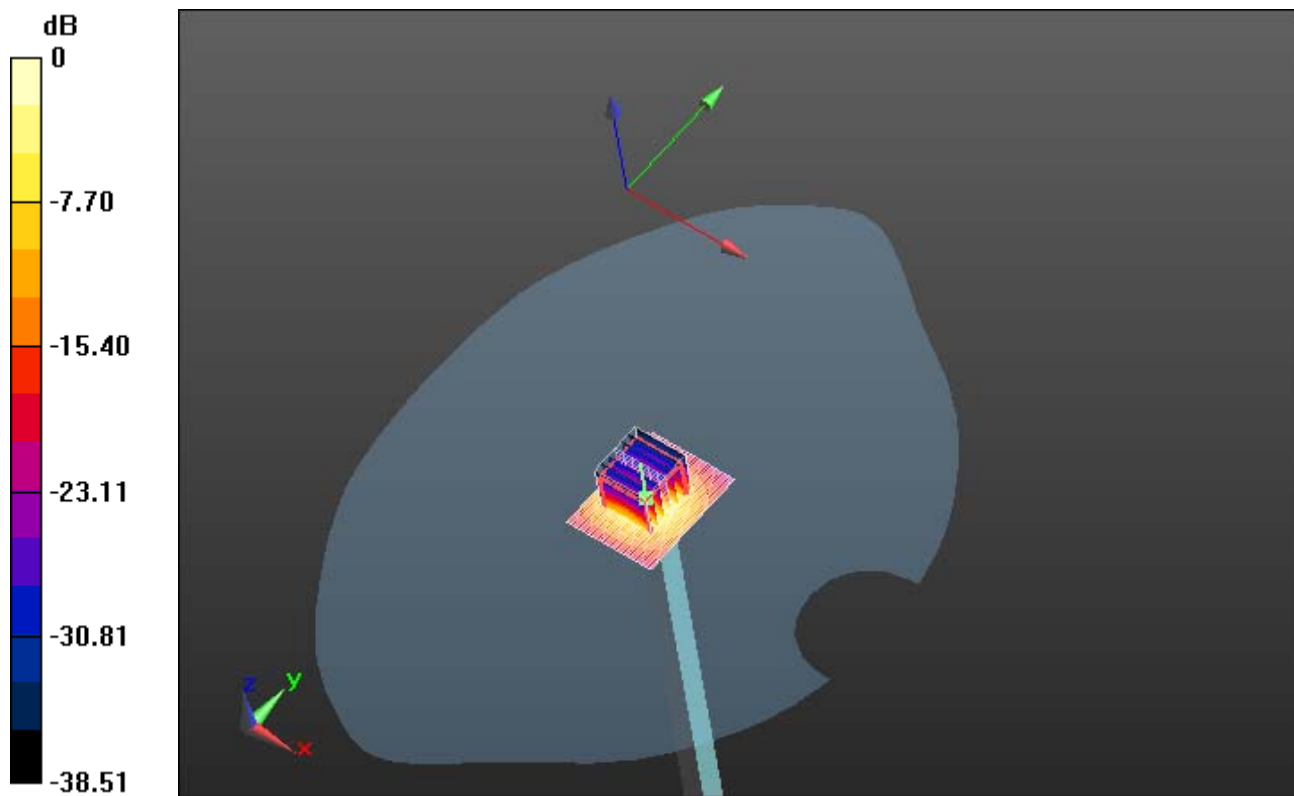
Reference Value = 208.5 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 413 W/kg

SAR(1 g) = 93.9 W/kg; SAR(10 g) = 26.7 W/kg

Maximum value of SAR (measured) = 194 W/kg

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0 dB = 194 W/kg = 22.88 dBW/kg

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Date/Time: 2/25/2013 4:48:05 PM

Test Laboratory: RIM Testing Services

Dipole

Validation_5500MHz_02_25_13_Amb_Tem_24.3_Liq_Tem_21.7C

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1033

Communication System: CW-5GHz; Frequency: 5500 MHz

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.128$ S/m; $\epsilon_r = 34.559$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.28, 4.28, 4.28); Calibrated: 11/14/2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

System Performance Check with D5GHzV2 Dipole 2/d=10mm,

Pin=1000mW, f=5500 MHz/Area Scan (41x51x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Reference Value = 201.1 V/m; Power Drift = 0.00 dB

Fast SAR: SAR(1 g) = 82.9 W/kg; SAR(10 g) = 22.3 W/kg

Maximum value of SAR (interpolated) = 204 W/kg

System Performance Check with D5GHzV2 Dipole 2/d=10mm,

Pin=1000mW, f=5500 MHz/Zoom Scan -Ext(24x24x22), Step (4x4x2mm), dist=2mm (7x7x12)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

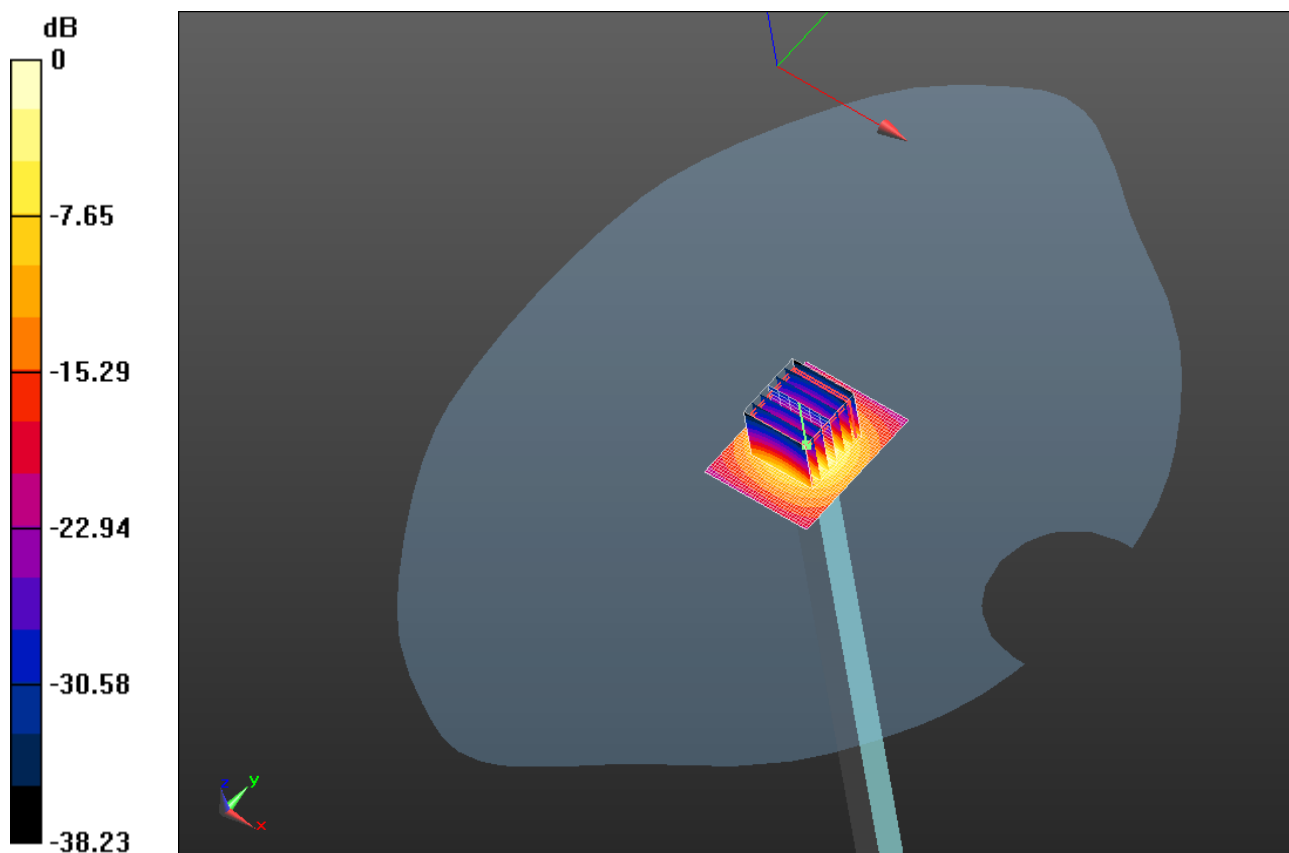
Reference Value = 201.1 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 361 W/kg

SAR(1 g) = 85.8 W/kg; SAR(10 g) = 24.5 W/kg

Maximum value of SAR (measured) = 179 W/kg

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0 dB = 179 W/kg = 22.53 dBW/kg

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Date/Time: 1/10/2013 7:55:51 PM

Test Laboratory: RIM Testing Services

Dipole Validation_5800 MHz_01_10_13

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1033

Communication System: CW-5GHz; Frequency: 5800 MHz; Communication System
PAR: 0 dB; PMF: 1

Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 5.504 \text{ S/m}$; $\epsilon_r = 34.728$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.12, 4.12, 4.12); Calibrated: 11/14/2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

System Performance Check with D5GHzV2 Dipole/d=10mm,

Pin=1000mW, f=5800 MHz/Area Scan (41x51x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 197.7 V/m; Power Drift = -0.01 dB

Fast SAR: SAR(1 g) = 83 W/kg; SAR(10 g) = 22.3 W/kg

Maximum value of SAR (interpolated) = 206 W/kg

System Performance Check with D5GHzV2 Dipole/d=10mm,

Pin=1000mW, f=5800 MHz/Zoom Scan -Ext(24x24x22), Step (4x4x2.0mm), dist=2mm (7x7x12)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

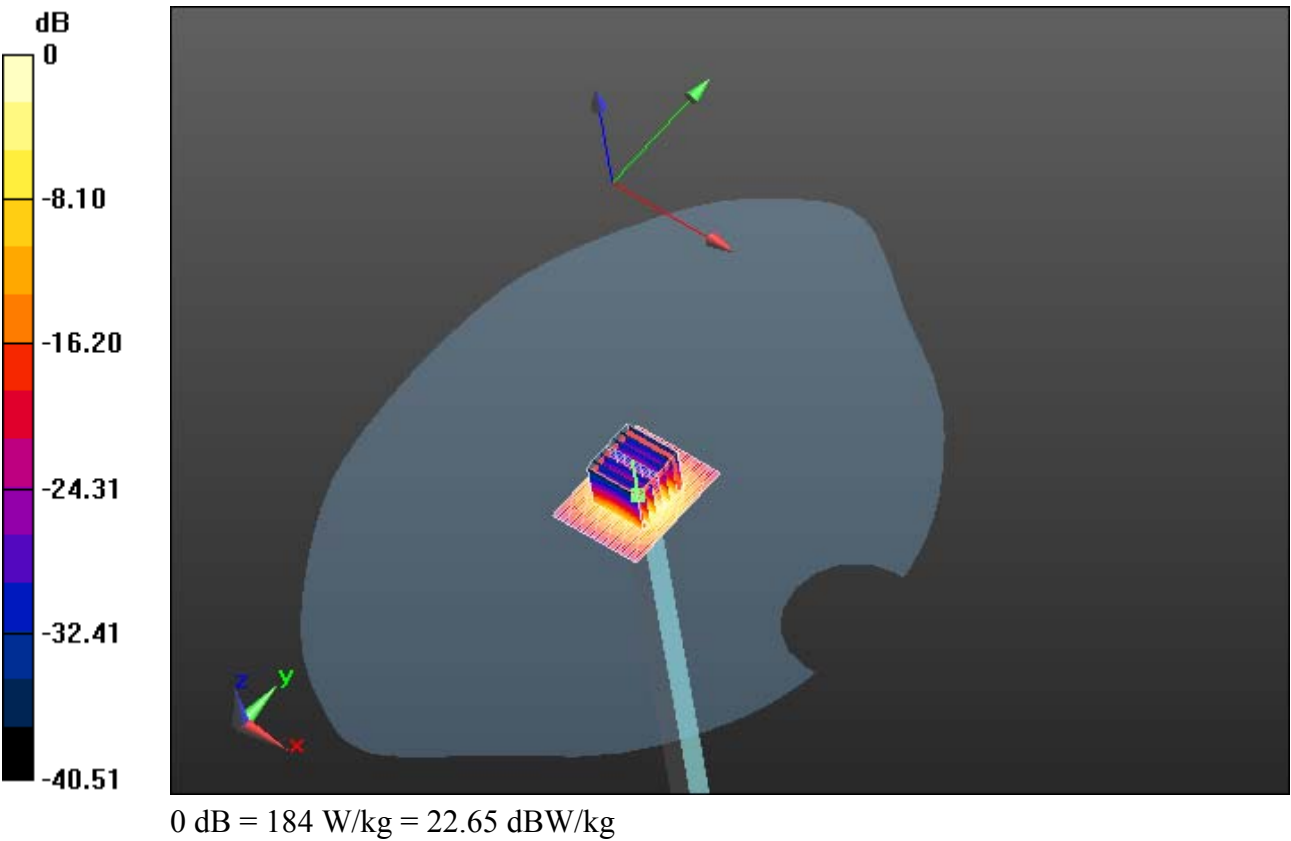
Reference Value = 197.7 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 375 W/kg

SAR(1 g) = 86.1 W/kg; SAR(10 g) = 24.4 W/kg

Maximum value of SAR (measured) = 184 W/kg

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Date/Time: 2/25/2013 4:26:43 PM

Test Laboratory: RIM Testing Services

Dipole

Validation_5800MHz_02_25_13_Amb_Tem_24.3_Liq_Tem_21.7C

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1033

Communication System: CW; Frequency: 5800 MHz

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.446$ S/m; $\epsilon_r = 33.979$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.12, 4.12, 4.12); Calibrated: 11/14/2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/7/2012
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)

System Performance Check with D5GHzV2 Dipole 3/d=10mm, Pin=1000 mW, f=5800 MHz 02/19/2013/Area Scan (41x51x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Reference Value = 195.1 V/m; Power Drift = 0.13 dB

Fast SAR: SAR(1 g) = 81 W/kg; SAR(10 g) = 21.8 W/kg

Maximum value of SAR (interpolated) = 200 W/kg

System Performance Check with D5GHzV2 Dipole 3/d=10mm, Pin=1000 mW, f=5800 MHz 02/19/2013/Zoom Scan -Ext(24x24x22), Step (4x4x2mm), dist=2mm (7x7x12)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

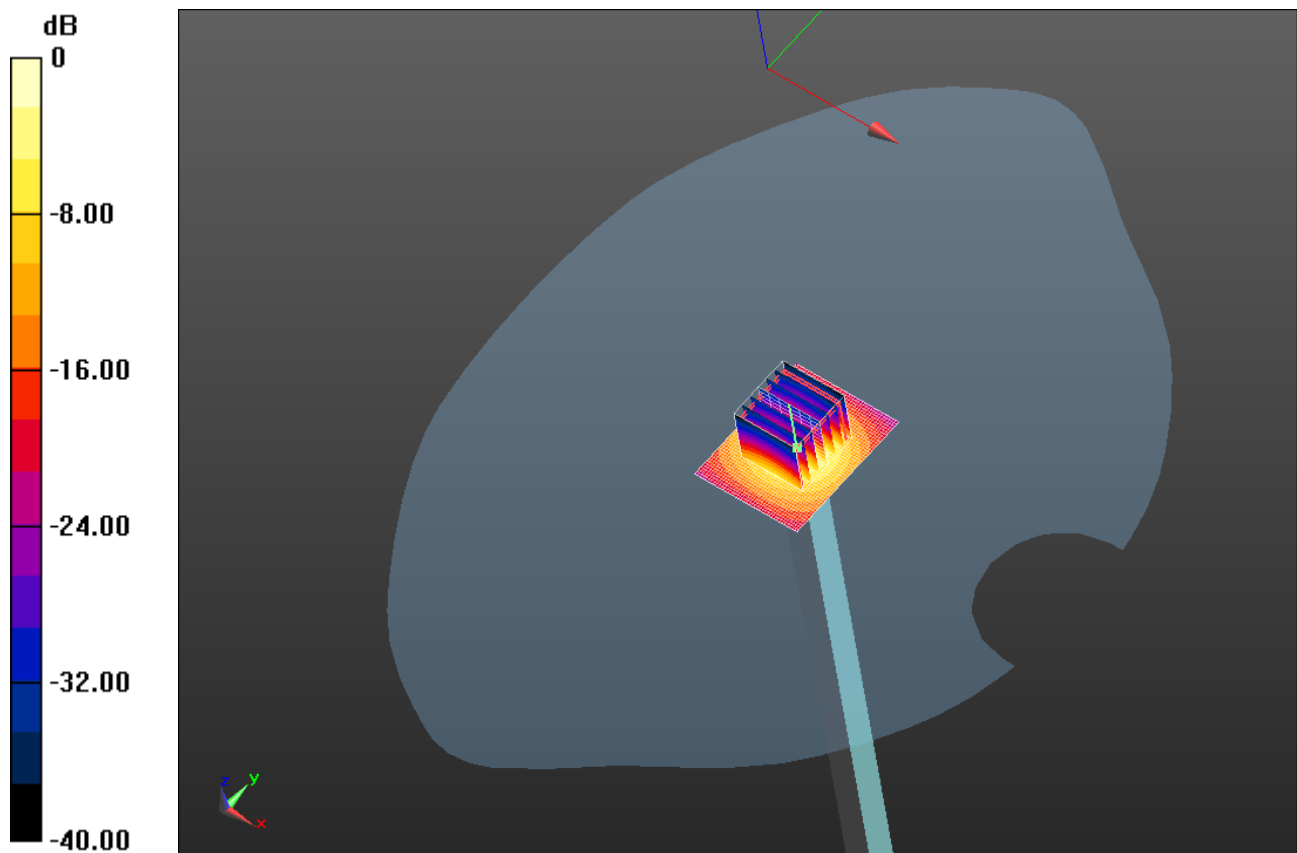
Reference Value = 195.1 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 362 W/kg

SAR(1 g) = 85.8 W/kg; SAR(10 g) = 24.4 W/kg

Maximum value of SAR (measured) = 180 W/kg

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0 dB = 180 W/kg = 22.55 dBW/kg

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Date/Time: 12/11/2014 11:19:02 AM

Test Laboratory: BlackBerry RTS

DipoleValidation_5200-5800MHz_12_11_14_Amb_Tem_23.7C_Liq_Tem_22.4C

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN 1033

Communication System: UID 0, CW (0); Frequency: 5200 MHz

Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 4.773 \text{ S/m}$; $\epsilon_r = 34.828$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.63, 4.63, 4.63); Calibrated: 11/10/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/18/2014
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

System Performance Check at Frequency 5.2 GHz/d=10mm, Pin=1000mW, dist=2.0mm (EX-Probe)/Area Scan (61x91x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$
Maximum value of SAR (interpolated) = 177 W/kg

System Performance Check at Frequency 5.2 GHz/d=10mm, Pin=1000mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x12) (7x7x12)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 197.9 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 330 W/kg
SAR(1 g) = 82.8 W/kg; SAR(10 g) = 24.1 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 168 W/kg

Date/Time: 12/11/2014 12:09:25 PM

Test Laboratory: BlackBerry RTS

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Author Data Andrew Becker	Dates of Test Nov. 26, 2012, Feb 28, Mar. 26, 2013, Dec. 10-12, 2014	Test Report No RTS-6026-1302-18 Rev 3	FCC ID: L6ARFN80UW	IC 2503A-RFN80UW

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN 1033

Communication System: UID 0, CW (0); Frequency: 5800 MHz

Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 5.424 \text{ S/m}$; $\epsilon_r = 34.285$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3592; ConvF(4.34, 4.34, 4.34); Calibrated: 11/10/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 23.0$
- Electronics: DAE3 Sn472; Calibrated: 3/18/2014
- Phantom: SAM 1; Type: SAM 4.0; Serial: 1076
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

System Performance Check at Frequency 5.8 GHz/d=10mm,

Pin=1000mW, dist=2.0mm (EX-Probe)/Area Scan (61x91x1): Interpolated

grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 187 W/kg

System Performance Check at Frequency 5.8 GHz/d=10mm,

Pin=1000mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x12)

(7x7x12)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

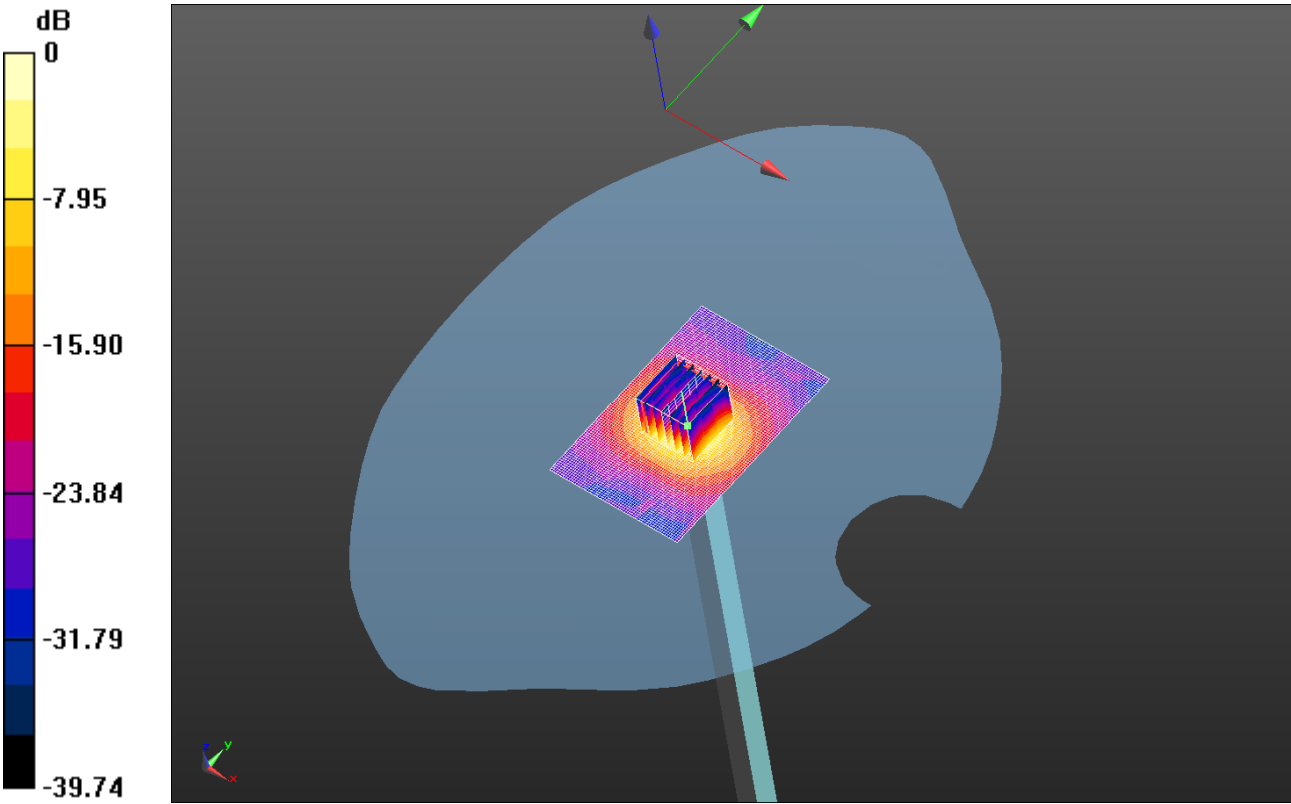
Reference Value = 191.7 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 376 W/kg

SAR(1 g) = 86.2 W/kg; SAR(10 g) = 24.7 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 177 W/kg

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0 dB = 177 W/kg = 22.48 dBW/kg